

What is claimed is:

1 1. A method for signaling an event or control function in a multicarrier
2 communication system, the method comprising:

3 determining that there is an event or control function to signal;

4 encoding an active state signal point in a constellation associated with a
5 subchannel, the signal point being reserved for signaling purposes; and

6 transmitting the constellation to signal the event or control function during data
7 mode.

1 2. The method of claim 1 wherein at least a portion of the method is carried
2 out by software instructions executing on digital signal processor (DSP) technology.

1 3. The method of claim 1 wherein the multicarrier communication system is
2 a discrete multitone (DMT) system.

1 4. The method of claim 1 wherein the subchannel has a one bit capacity.

1 5. The method of claim 1 wherein the subchannel has a bit capacity of more
2 than one bit, and is assigned to a latency path that is subjected to error correction.

1 6. The method of claim 1 wherein the signal point reserved for signaling
2 purposes is established during an initialization procedure before entering the data mode.

1 7. The method of claim 1 wherein any non-signaling data pattern that is
2 randomly assigned to the signal point reserved for signaling purposes is forced on to a
3 pre-established replacement signal point.

1 8. The method of claim 7 wherein bit loading assignment and bit swapping
2 algorithms associated with the multicarrier communication system are programmed to

3 effect selective use of the signal point reserved for signaling purposes and the pre-
4 established replacement signal point.

1 9. The method of claim 7 wherein known errors generated by forcing data on
2 to the pre-established replacement signal point are corrected by error correction
3 techniques.

1 10. The method of claim 7 wherein the pre-established replacement signal is
2 established during an initialization procedure before entering the data mode.

1 11. The method of claim 1 wherein the step of encoding an active state signal
2 point includes changing the signal point from an inactive state to an active state.

1 12. The method of claim 1 wherein in response to determining that there is no
2 event or control function to signal, the signal point reserved for signaling purposes is
3 encoded to its inactive state.

1 13. The method of claim 1 wherein the signaled event or control function
2 takes effect after a predetermined turn around period.

1 14. A method for signaling an event or control function in a multicarrier
2 communication system, the method comprising:

3 determining that there is an event or control function to signal;
4 encoding a symbol associated with a first symbol data pattern with a data pattern
5 that is distinct from the first symbol data pattern and its inversion thereby
6 producing a distinct signaling symbol; and
7 transmitting the distinct signaling symbol to signal the event or control function
8 during data mode.

1 15. The method of claim 14 wherein at least a portion of the method is carried
2 out by software instructions executing on digital signal processor (DSP) technology.

adjusting parameters of the system to effect the event or control function after a pre-established turn around period.

24. The method of claim 23 wherein the multicarrier communication system is a discrete multitone (DMT) system.

25. The method of claim 23 wherein the signal point reserved for signaling purposes is associated with a subchannel having a one bit capacity.

26. The method of claim 23 wherein the signal point reserved for signaling purposes is associated with a subchannel having a bit capacity of more than one bit, and is assigned to a latency path that is subjected to error correction.

27. The method of claim 23 wherein the signal point reserved for signaling purposes is established during an initialization procedure before entering the data mode.

28. The method of claim 23 further comprising:
correcting with forward error correction known errors generated by forcing non-signaling data randomly assigned to the signal point reserved for signaling purposes on to a pre-established replacement signal point.

29. The method of claim 28 wherein bit loading assignment and bit swapping algorithms associated with the multicarrier communication system are programmed to effect selective use of the signal point reserved for signaling purposes and the pre-established replacement signal point.

30. The method of claim 28 wherein the pre-established replacement signal is established during an initialization procedure before entering the data mode.

31. The method of claim 23 wherein the parameters include modem configuration parameters associated with the event or control function being signaled.

1 32. A method for signaling an event or control function in a multicarrier
2 communication system operating in data mode, the method comprising:

3 decoding a distinct signaling symbol having a data pattern reserved for signaling
4 an event or control function; and

5 adjusting parameters of the system to effect the event or control function after a
6 pre-established turn around period.

1 33. The method of claim 32 wherein the multicarrier communication system is
2 a discrete multitone (DMT) system.

1 34. The method of claim 32 wherein the data pattern reserved for signaling the
2 event or control function is associated with the event or control function before the
3 communication system enters the data mode.

1 35. The method of claim 32 wherein the distinct signaling symbol is a sync
2 symbol which has had its sync symbol data pattern replaced by the data pattern reserved
3 for signaling the event or control function.

1 36. The method of claim 32 wherein the distinct signaling symbol is
2 transmitted once every superframe.

1 37. The method of claim 32 wherein the data pattern reserved for signaling the
2 event or control function is a shifted version of a sync symbol data pattern.

1 38. A modem adapted to signal an event or control function in a multicarrier
2 communication system during data mode, the modem comprising:

3 an encoder module adapted to encode an active state signal point in a
4 constellation associated with a subchannel, the signal point being reserved
5 for signaling purposes.

1 46. The modem of claim 44 wherein the symbol associated with the first
2 symbol data pattern is a sync symbol, and the first symbol data pattern is a sync symbol
3 data pattern.

1 47. The modem of claim 44 wherein the signaled event or control function
2 takes effect after a predetermined turn around period.

1 48. The modem of claim 44 wherein the symbol associated with the first
2 symbol data pattern is transmitted once every superframe.

1 49. The modem of claim 44 wherein the data pattern that is distinct from the
2 first symbol data pattern and its inversion is a shifted version of the first symbol data
3 pattern.

1 50. A modem adapted to signal an event or control function in a multicarrier
2 communication system during data mode, the modem comprising:

3 a decoder module adapted to decode received information and to detect a
4 constellation signal point reserved for signaling purposes in its active
5 state.

1 51. A modem adapted to signal an event or control function in a multicarrier
2 communication system during data mode, the modem comprising:

3 a decoder module adapted to decode a distinct signaling symbol having a data
4 pattern reserved for signaling an event or control function, wherein the
5 distinct signaling symbol is a symbol which has had its symbol data
6 pattern replaced by the data pattern reserved for signaling the event or
7 control function.

1 52. A method for performing initialization in a multicarrier communication
2 system including a transmitter-receiver pair, the method comprising:

3 determining the bit capacity of each subchannel included in the multicarrier
 4 system; and
 5 establishing, for the transmitter-receiver pair, a 1-bit subchannel as reserved for
 6 signaling a particular event or control function.

1 53. A method for performing initialization in a multicarrier communication
 2 system including a transmitter-receiver pair, the method comprising:
 3 determining the bit capacity of each subchannel included in the multicarrier
 4 system; and
 5 establishing, for the transmitter-receiver pair, a constellation signal point as
 6 reserved for signaling a particular event or control function.